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526 Rec'd PCT/PTO 21 JUL 2000

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		Attorney's Docket Number 67526
		U.S. Application No. (if known see 17 C.F.R. 1.55) 09/600832
INTERNATIONAL APPLICATION NO. PCT/DE99/03704	INTERNATIONAL FILING DATE November 22, 1999	PRIORITY DATE CLAIMED 23/Nov/1998
TITLE OF INVENTION SLOT COVER OF A SHIFTING DEVICE		
APPLICANT(S) FOR DO/EO/US GIEFER		

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(C)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern other documents (s) or information included:

11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98
12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
☐ A SECOND or SUBSEQUENT preliminary amendment.
14. ☒ A substitute specification.
15. ☐ A change of power of attorney and/or address letter.
16. ☒ Other items or information:
Formal Drawings (3 sheets)
Copy of Express Mail Receipt No. EL597140449US
Marked Up Copy of the Translation

U.S. Appln No. (if known, sec. 37 CFR 15) 09/600832	International Application No. PCT/DE99/03704	Attorney's Docket Number 67526
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17. [X] The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)):

Search Report has been prepared by the EPO or JPO \$840.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)
..... \$670.00

No international preliminary examination fee paid to USPTO (37 CFR 1.482)
but international search fee paid to USPTO (37 CFR 1.445(a)(2)) \$760.00

Neither international preliminary examination fee (37 CFR 1.482 nor
international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$970.00

International preliminary examination fee paid to USPTO (37 CFR 1.482)
and all claims satisfied provisions of PCT Article 33(2)-(4) \$96.00

CALCULATIONS PTO USE ONLY

ENTER APPROPRIATE BASIC FEE AMOUNT =

\$ 840.00

Surcharge of \$130.00 for furnishing the oath or declaration later than [] 20 [] 30
months from the earliest claimed priority date (37 CFR 1.492(e))

\$

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	17 - 20 =	0	X \$ 18.00	\$ 0	
Independent claims	1 - 3 =	0	X \$ 78.00	\$ 0	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ \$260.00	\$ 0	
TOTAL OF ABOVE CALCULATIONS =				\$ 0	

Reduction of 1/2 for filing small entity, if applicable. Verified Small Entity Statement must also be
filed (Note 37 CFR 1.9, 1.27, 1.28)

\$

SUBTOTAL =

\$ 840.00

Processing fee of \$130.00 for furnishing the English translation late than [] 20 [] 30 months
from the earliest claimed priority date (37 CFR 1.492(f)).

\$

TOTAL NATIONAL FEE =

\$ 840.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be
accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +

\$ 40.00

TOTAL FEES ENCLOSED =

\$ 880.00

Amount to be:
refunded

\$

charged

\$

a. [X] A check in the amount of \$ 880.00 to cover the above fees is enclosed.

b. [] Please charge my Deposit Account No. 13-0410 in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.

c. [X] The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit
Account No. 13.0410. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b))
must be filed and granted to restore the application to pending status.

Send all correspondence to:

McGLEW AND TUTTLE, P.C.
Scarborough Station
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Signature

John James McGlew
Name

31,903

Registration Number

007220 20030909

09/600832

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ATTORNEY DOCKET NO: 67526

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : GIEFER
PCT No : PCT/DE99/03704
Filed :
For : SLOT COVER...
Dated : July 21, 2000

Hon. Commissioner of Patents
and Trademarks
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Prior to initial examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Please replace the specification originally filed, with the enclosed substitute specification. A marked up copy of showing changes to the original translation is attached.

Applicant states that no new matter has been added.

IN THE CLAIMS:

Please cancel claims 1 to 17 without prejudice and replace them with the following new claims:

18. A motor vehicle transmission shifting device slot cover, the shifting device having a selector lever and kinematics for transmitting the selection movements to the transmission and at least one shift gate, the slot cover comprising:

a movable louver which covers the at least one shift gate, said louver having at least one opening for the passage of the selector lever, said louver being an endless band forming a closed loop;

a louver guide for guiding the movable louver.

19. A slot cover in accordance with claim 18, wherein said louver guide has at least one deflecting element.

20. A slot cover in accordance with claim 19, wherein said at least one said deflecting element has a curved deflecting surface.

21. A slot cover in accordance with claim 20, wherein said at least one said deflecting element is one of a pulley having a deflecting axis or a deflecting shaft.

22. A slot cover in accordance with claim 20, wherein the deflecting element is a continuous rotating deflecting roller which has a gear at its edge.

23. A slot cover in accordance with claim 20, wherein said deflecting element comprises two coaxially mounted deflecting rollers which are separated from one another and have elevated edge beads.

24. A slot cover in accordance with claim 20, wherein said deflecting element is arranged within said louver closed loop.

25. A slot cover in accordance with claim 20, said deflecting element is arranged outside said louver loop.

26. A slot cover in accordance with claim 20, wherein said louver guide includes a support structure, said deflecting element being mounted elastically to said support structure.

27. A slot cover in accordance with claim 18, wherein said louver comprises an elastic louver portion having elastic properties, at least in the circumferential direction of the closed loop, said elastic louver portion being provided over at least a part of a length of said louver.

28. A slot cover in accordance with claim 18, wherein said louver comprises a plurality of parts.

29. A slot cover in accordance with claim 18, wherein said louver guide includes a support structure with slide rails arranged laterally and engaged by said louver for guiding said louver.

30. A slot cover in accordance with claim 18, wherein said louver has two openings,

through which the selector lever passes.

31. A slot cover in accordance with claim 18, further comprising:

a cover plate with the shift gate provided for the selector lever.

32. A slot cover in accordance with claim 18, further comprising:

signal transmitters;

signal receivers, signals of said signal transmitters being detected by signal receivers arranged at spaced locations from them, arranged on the deflecting elements for detecting the shift positions of the selector lever.

33. A slot cover in accordance with claim 32, wherein signal transmitters include permanent magnets and said signal receivers are hall sensors, shift positions being detected by means of said Hall sensors and permanent magnets associated with them, wherein a pair of measured values is correspondingly assigned to each shift position.

34. A slot cover in accordance with claims 18, further comprising a cover plate, said louver guide being moveable in relation to said cover plate at right angles to the direction of movement of the louver.

REMARKS


Claims 18 through 34 are in this application and are presented for consideration. Claims 1 through 17 have been cancelled. The new claims present subject matter similar to the original claims, but in a different form.

The specification and claims have been amended in order to place this application in better form. The reference to claims in the specification has been deleted or amended. Appropriate headings have been added. No new matter has been added.

Favorable action on the merits is respectfully requested.

Respectfully submitted
for Applicant,

By:


John James McGlew
Registration No. 31,903
McGLEW AND TUTTLE, P.C.

JJM:jj/sk
67526.1

Enclosed: Substitute Specification and Marked Up Copy of Translation

DATED: July 21, 2000
SCARBOROUGH STATION
SCARBOROUGH, NEW YORK 10510-0827
(914) 941-5600

SHOULD ANY OTHER FEE BE REQUIRED, THE PATENT AND TRADEMARK OFFICE IS HEREBY REQUESTED TO CHARGE SUCH FEE TO OUR DEPOSIT ACCOUNT 13-0410.

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH

THE UNITED STATES POSTAL SERVICE AS EXPRESS MAIL IN AN ENVELOPE
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WASHINGTON, D.C. 20231, NO.: EL597140449US

McGLEW AND TUTTLE, P.C.
SCARBOROUGH STATION, SCARBOROUGH, NY 10510-0827

BY: *Jon Quinforte* DATE: July 21, 2000

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Docket # 67526

SLOT COVER OF A SHIFTING DEVICE

FIELD OF THE INVENTION

The present invention pertains to a slot cover of a shifting device of a motor vehicle transmission with a selector lever and a kinematics for transmitting the selection movements to a transmission, preferably an automatic transmission, with a movable louver, which covers at least one movement gate (shift gate, selection gate), and with a guide for the louver, wherein the louver has at least one opening for the passage of the selector lever.

BACKGROUND OF THE INVENTION

A similar slot cover has is known from DE 44 45 925 C1. This document discloses a slot cover of a shifting device for an automatic transmission of a motor vehicle with a selector lever, wherein the movable louver, which covers the shift gate, is guided by laterally arranged

guide rails (U sections), and wherein the louver has an opening, through which the selector lever passes. The louver itself is rigid at right angles to its direction of movement and can be easily bent in the direction of movement.

5 This design is associated with the problem that the louver causes rattling or grating noises during movements in the guide or even during vibrations. Furthermore, the guiding of the louver is problematic concerning its durability and reliability of operation, because the ends of the louver are free and breakage or other damage to the louver may easily occur as a result.

A similar slot cover has already been known from DE 44 45 925 C1. This document discloses a slot cover of a shifting device for an automatic transmission of a motor vehicle with a selector lever, wherein the movable louver, which covers the shift gate, is guided by laterally arranged guide rails (U sections), and wherein the louver has an opening, through which the selector lever passes. The louver itself is rigid at right angles to its direction of movement and can be easily bent in the direction of movement.

This design is associated with the problem that the louver causes rattling or grating noises during movements in the guide or even during vibrations. Furthermore, the guiding of the louver is problematic concerning its durability and reliability of operation, because the ends of the louver are free and breakage or other damage to the louver may easily occur as a result.

SUMMARY AND OBJECTS OF THE INVENTION

20 The object of the present invention is to find a slot cover for a shifting device of a motor vehicle transmission which can be moved with low noise, on the one hand, and

guarantees reliable guiding of the louver, on the other hand.

According to the invention, a motor vehicle transmission shifting device slot cover with a selector lever and kinematic transmission links for transmitting the selection movements to the automatic transmission is provided. The cover has a movable louver, which covers at least one movement gate (shift gate, selection gate), and with a guide for the louver. The louver has at least one opening for the passage of the selector lever. The louver is an endless band, which forms a closed loop.

Due to this embodiment of the louver as an endless band, the guiding of the louver is improved, because not only forces acting in one direction, but also both pulling and compressive forces will now act on the louver during the forward or backward movement of the selector lever at the same time. Furthermore, it becomes possible due to this embodiment to make the louver especially supple, because the guiding of the louver is substantially improved due to the bypassing of the force, and the intrinsic rigidity of the louver, which was necessary in the state of the art, is no longer necessary. Since soft materials do not tend to rattle, the louver according to the present invention also has low noise.

According to a special embodiment of the slot cover, provisions are made for the guide of the louver to have at least one deflecting element, wherein a deflecting element may optionally consist of one or more deflecting rollers, which rotate around a deflection axis. In addition, the deflecting element, of which there is at least one, may also have curved sliding surfaces for the louver, around which the deflecting takes place.

A plurality of deflecting elements, preferably four deflection axes, are provided for

guiding the louver in a preferred embodiment of the slot cover. It is especially advantageous for at least two deflection axes to be arranged within the loop formed by the louver, wherein it is additionally advantageous for at least one deflection axis and preferably two deflection axes to be located outside the louver loop. Due to the arrangement of two deflection axes within the louver loop, the louver can be stretched in the corresponding manner, while the deflecting element, of which there is at least one, which is located outside the louver loop, can ensure a corresponding tension of the louver.

A deflection axis may comprise, on the one hand, an individual, transversely extending deflecting roller or two laterally arranged, short deflecting rollers, which may in turn extend coaxially.

In another advantageous embodiment of the slot cover, at least one of the deflecting elements is mounted elastically. Due to the mounting, the louver loop is able to provide an internal tension, which makes possible an especially problem-free and reliable guiding of the louver. On the other hand, it is also possible to make the louver itself elastic, at least over part of its loop, so that the preferred tension that shall load the louver will be brought about by the elasticity of the louver itself. However, it is not absolutely necessary to make the entire louver elastic in this case, but it is sufficient for part of the loop to be elastic. These may be preferably narrow loops of the louver.

It may also be advantageous in this connection for the louver to have a multipart design. For example, it is possible to design the covering part proper of the louver as a lamella-type covering part, while the connection parts at the part of the louver that is designed as a lamella-

type part have at least one elastic element, e.g., a spring or an elastic band.

Another advantageous embodiment provides preferably laterally arranged slide rails for guiding the louver, which said rails are laterally engaged by the louver. An especially reliable guiding is guaranteed by this embodiment.

5 Other advantageous embodiments of the louver provide for the louver being made as a louver consisting of a rubber or plastic band, as a wire loop or as a louver consisting of other materials, in which case it is also possible to design the louver - at least partially - as a series of lamellae placed transversely located next to one another.

According to an embodiment of the slot cover according to the present invention, provisions may be made for the slot cover being guided completely above the shifting device proper. As a result, it is possible to provide two openings in the louver, with one of the openings surrounding the selector lever in a relatively accurately fitting manner, while the other opening has a sufficient clearance, so that movements of the selector lever, which lead to an opposite movement of the louver loop on the lower side of the louver, are made possible.

Moreover, a selector lever shift position detector may be additionally integrated in a slot cover according to the present invention in a simple manner. For example, signal transmitters, whose signals are detected by signal receivers arranged at spaced locations, may be arranged at the deflecting elements. The principle, which functions similarly to the tachometer, may be embodied, e.g., by means of Hall sensors and permanent magnets, wherein
20 a pair of measured values is assigned to each shift position.

It is evident that the features of the present invention that were mentioned above and

will be explained below may be used not only in the particular combination indicated, but in other combinations or alone as well without going beyond the scope of the present invention.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference is made to the accompanying drawings and descriptive matter in which preferred embodiments of the invention are illustrated.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

- Figure 1 is a bottom view of a slot cover with four deflection axes;
- Figure 2 is a side view of the slot cover;
- Figure 3 is an oblique 3D bottom view of the slot cover;
- Figure 4 is a longitudinal sectional view of the slot cover with cover plate;
- Figure 5 is a front view of the slot cover with cover plate;
- Figure 6 is a slot cover including the lateral offset; and
- Figure 7 is a slot cover with the cover plate and the possibility of lateral offset.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings in particular, Figures 1, 2 and 3 show different views of the slot cover according to the present invention. Figure 1 shows a bottom view of the slot cover.

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The slot cover comprises a support structure 5, which comprises a central plate 5.3 arranged in the middle and two supports 5.1 and 5.2 arranged to the side of it. A generous opening 5.4 is provided in the central plate 5.3. Two deflecting elements, which are formed by two broad deflecting rollers 3.1 and 3.2, at the ends of which two gears 3.3 and 3.4 as well as 3.5 and 3.6 are arranged, are arranged at the outer ends of the support structure 5. The broad deflecting rollers 3.1 and 3.2 are mounted rotatably at the ends of the respective lateral supports 5.1 and 5.2. Furthermore, four narrow deflecting rollers 4.1 through 4.4, which form a rectangle with one another with two deflection axes, are located in the central area of the supports 5.1 and 5.2. The narrow deflecting rollers 4.1 through 4.4 are also mounted rotatably in the lateral supports 5.1 and 5.2. The louver 2, which forms an endless band, is guided around the deflecting rollers, and part of this endless band consists of a broad band 2.1 and the other part of two narrow bands 2.2 and 2.3, respectively, which pass over with their ends into the ends of the broad band. An opening is provided for the selector lever in the area of the broad band 2.1, and the two narrow bands 2.2 and 2.3 themselves form an opening through which a selector lever can be passed.

20

The guiding of the band can be recognized especially clearly from Figure 2, which shows a side view of the slot cover. The band is guided such that the louver 2 surrounds the two broad deflecting rollers 3.1 and 3.2 on the end side and rolls on the gears 3.3 through 3.6 arranged on the broad deflecting rollers. The narrow deflecting rollers 4.1 through 4.4 are arranged outside the circumference of the band, and the small deflecting rollers 4.1 through 4.4 are pressed into the loop of the louver 2 and thus ensure a corresponding tension of the louver.

On their edges, the deflecting rollers 4.1 through 4.4 have beads, which prevent the narrow bands 2.2 and 2.3 from breaking out. The division of the louver 2 in the area of the broad band 2.1 and in the area of the narrow bands 2.2 and 2.3 is designed such that the narrow deflecting rollers 4.1 through 4.4 come into contact only with the narrow bands 2.2 and 2.3 during a movement of the selector lever.

An additional guiding of the louver 2 is achieved by means of the lateral supports 5.1 and 5.2, which are curved on their top side and form a curvature, over which the louver 2 can slide. In addition, part of the central plate 5.3 is adapted to the curvature of the lateral supports 5.1 and 5.2, so that an improvement of the guiding of the louver is also achieved.

Figure 3 shows an oblique 3D bottom view of the slot cover according to the present invention, which once again illustrates the guiding of the louver and the function of the individual deflecting rollers.

The louver is very simple in terms of production technology in this preferred example, because, due to the entire design of the slot cover, it is possible to use a very thin and flexible endless rubber band, in which part of the rubber band is cut out on the inside, so that only the two narrow side bands 2.2 and 2.3 are left. In addition, the endless rubber band may be cut out of a long tube.

Figures 4 and 5 additionally show a longitudinal section and a front view of the slot cover according to the present invention with a cover plate 6, in which the shift and selection gates 7 for the selector lever are located.

If the slot cover according to the present invention is to be used for a shifting device

with shift gates that have a lateral deflection, the opening for the selector lever in the louver 2 may be made in the area of the broad band 2.1 in the known manner such that either a sufficiently broad slot is inserted for the selector lever, or an additional, transversely movable louver is integrated within the louver or is placed over the broad slot, so that complete coverage of the slot is always ensured.

Another possibility of covering the lateral mobility of the selector lever, in which case only a fitting hole is provided for the selector lever in the broad band, can be obtained by arranging the entire slot cover 1 laterally displaceably in relation to the cover plate 6, so that the entire slot cover 1 likewise moves to the side during a sideways movement of the selector lever.

Figures 6 and 7 show such a slot cover 1, which can be displaced as a whole in relation to the cover plate 6 by a sideways movement of the selector lever.

Figure 6 shows the slot cover 1 with a selector lever 8, which is passed through an opening 2.4 through the louver 2. A lateral position of the selector lever 8, by which the entire slot cover 1 including the support structure 5 is also displaced to the side, is indicated by broken line.

Figure 7 shows a bottom view of a cover plate 6, under which the slot cover 1 according to the present invention is arranged. The selector lever 8 - fixed in a sideways pivoted position - is indicated by broken line here as well, in which case the slot cover 1 has also been displaced in relation to the cover plate 6. The displaceability of the slot cover 1 in relation to the cover plate 6 may be achieved, e.g., by the support structure itself being fastened

on the shifting device or on the slot cover with a bracket, which allows a lateral movement of the slot cover. It would be possible, e.g., to clip the slot cover with the axes of the broad deflecting rollers 3.1 and 3.2 in a clamp on the narrow sides, where the said clamps are substantially narrower in their broad extension than the length of the broad deflecting rollers, so that the entire slot cover 1 can be moved on it from right to left.

On the whole, it is consequently achieved with the slot cover according to the present invention of a shifting device of a motor vehicle transmission that reliable guiding of the louver is brought about and the louver is movable in the guide with low noise.

According to another aspect of the present invention, it is now also possible to make do without a second louver for covering the lateral mobility with a very simple design of the slot cover in shifting devices that are equipped with laterally movable selector levers, because the entire cover can now move laterally in itself.

While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

ABSTRACT OF THE DISCLOSURE

A slot cover of a shifting device of a motor vehicle transmission with a selector lever and kinematics for transmitting the selection movements to the automatic transmission is provided with a movable louver. The louver covers at least one movement gate (shift gate, selection gate) and with a guide for the louver. The louver has at least one opening for the passage of the selector lever. The louver is an endless band, which forms a closed loop.

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SLOT COVER OF A SHIFTING DEVICE

Specification:

5 The present invention pertains to a slot cover of a shifting device of a motor vehicle transmission with a selector lever and a kinematics for transmitting the selection movements to a transmission, preferably an automatic transmission, with a movable louver, which covers at least one movement gate (shift gate, selection gate), and with a guide for the louver, wherein the louver has at least one opening for the passage of the selector lever.

10 A similar slot cover has already been known from DE 44 45 925 C1. This document discloses a slot cover of a shifting device for an automatic transmission of a motor vehicle with a selector lever, wherein the movable louver, which covers the shift gate, is guided by laterally arranged guide rails (U sections), and wherein the louver has an opening, through which the selector lever passes. The louver itself is rigid at right angles to its direction of movement and can be easily bent in the direction of movement.

15 This design is associated with the problem that the louver causes rattling or grating noises during movements in the guide or even during vibrations. Furthermore, the guiding of the louver is problematic concerning its durability and reliability of operation, because the ends of the louver are free and breakage or other damage to the louver may easily occur as a result.

The object of the present invention is to find a slot cover for a shifting device of a motor vehicle transmission which can be moved with low noise, on the one hand, and guarantees reliable guiding of the louver, on the other hand.

20 The object of the present invention is accomplished by the features of claim 1.

It is proposed according to the present invention that the prior-art slot cover of a shifting device of a motor vehicle

transmission, which has a selector lever and a kinematics for transmitting the selection movements to a transmission and which has a movable louver, which covers at least one movement gate (shift gate, selection gate) of the shifting device and has a guide for the louver, where there is at least one opening in the louver for the passage of the selector lever, be improved such that the louver is designed as an endless band, which forms a closed loop.

Due to this embodiment of the louver as an endless band, the guiding of the louver is improved, because not only forces acting in one direction, but also both pulling and compressive forces will now act on the louver during the forward or backward movement of the selector lever at the same time. Furthermore, it becomes possible due to this embodiment to make the louver especially supple, because the guiding of the louver is substantially improved due to the bypassing of the force, and the intrinsic rigidity of the louver, which was necessary in the state of the art, is no longer necessary. Since soft materials do not tend to rattle, the louver according to the present invention also has low noise.

According to a special embodiment of the slot cover, provisions are made for the guide of the louver to have at least one deflecting element, wherein a deflecting element may optionally consist of one or more deflecting rollers, which rotate around a deflection axis. In addition, the deflecting element, of which there is at least one, may also have curved sliding surfaces for the louver, around which the deflecting takes place.

A plurality of deflecting elements, preferably four deflection axes, are provided for guiding the louver in a preferred embodiment of the slot cover. It is especially advantageous for at least two deflection axes to be arranged within the loop formed by the louver, wherein it is additionally advantageous for at least one deflection axis and preferably two deflection axes to be located outside the louver loop. Due to the arrangement of two deflection axes within the louver loop, the louver can be stretched in the corresponding manner, while the deflecting element, of which there is at least one, which is located outside the louver loop, can ensure a corresponding tension of the louver.

A deflection axis may comprise, on the one hand, an individual, transversely extending deflecting roller or two laterally arranged, short deflecting rollers, which may in turn extend coaxially.

In another advantageous embodiment of the slot cover, at least one of the deflecting elements is mounted

elastically. Due to the mounting, the louver loop is able to provide an internal tension, which makes possible an especially problem-free and reliable guiding of the louver. On the other hand, it is also possible to make the louver itself elastic, at least over part of its loop, so that the preferred tension that shall load the louver will be brought about by the elasticity of the louver itself. However, it is not absolutely necessary to make the entire louver elastic in this case, but it is sufficient for part of the loop to be elastic. These may be preferably narrow loops of the louver.

It may also be advantageous in this connection for the louver to have a multipart design. For example, it is possible to design the covering part proper of the louver as a lamella-type covering part, while the connection parts between the part of the louver that is designed as a lamella-type part [no other component is mentioned to justify "between" - Tr.Ed.] have at least one elastic element, e.g., a spring or an elastic band.

Another advantageous embodiment provides preferably laterally arranged slide rails for guiding the louver, which said rails are laterally engaged by the louver. An especially reliable guiding is guaranteed by this embodiment.

Other advantageous embodiments of the louver provide for the louver being made as a louver consisting of a rubber or plastic band, as a wire loop or as a louver consisting of other materials, in which case it is also possible to design the louver - at least partially - as a series of lamellae placed transversely located next to one another.

According to an embodiment of the slot cover according to the present invention, provisions may be made for the slot cover being guided completely above the shifting device proper. As a result, it is possible to provide two openings in the louver, with one of the openings surrounding the selector lever in a relatively accurately fitting manner, while the other opening has a sufficient clearance, so that movements of the selector lever, which lead to an opposite movement of the louver loop on the lower side of the louver, are made possible.

Moreover, a means for detecting the shift position of the selector lever may be additionally integrated in a slot cover according to the present invention in a simple manner. For example, signal transmitters, whose signals are detected by signal receivers arranged at spaced locations, may be arranged at the deflecting elements. The principle, which functions similarly to the tachometer, may be embodied, e.g., by means of Hall sensors and permanent magnets, wherein a pair of measured values is assigned to each shift position.

It is evident that the features of the present invention that were mentioned above and will be explained below may be used not only in the particular combination indicated, but in other combinations or alone as well without going beyond the scope of the present invention.

Other features and advantages of the present invention appear from the subclaims and the following description of a preferred exemplary embodiment with reference to the drawings.

The figures show specifically:

- Figure 1 shows the bottom view of a slot cover with four deflection axes;
- Figure 2 shows the side view of the slot cover;
- Figure 3 shows an oblique 3D bottom view of the slot cover;
- Figure 4 shows a longitudinal section of the slot cover with cover plate;
- Figure 5 shows the front view of the slot cover with cover plate;
- Figure 6 shows the slot cover including the lateral offset; and
- Figure 7 shows the slot cover with the cover plate and the possibility of lateral offset.

Figures 1, 2 and 3 show different views of the slot cover according to the present invention.

Figure 1 shows a bottom view of the slot cover. The slot cover comprises a support structure 5, which comprises a central plate 5.3 arranged in the middle and two supports 5.1 and 5.2 arranged to the side of it. A generous opening 5.4 is provided in the central plate 5.3. Two deflecting elements, which are formed by two broad deflecting rollers 3.1 and 3.2, at the ends of which two gears 3.3 and 3.4 as well as 3.5 and 3.6 are arranged, are arranged at the outer ends of the support structure 5. The broad deflecting rollers 3.1 and 3.2 are mounted rotatably at the ends of the respective lateral supports 5.1 and 5.2. Furthermore, four narrow deflecting rollers 4.1 through 4.4, which form a rectangle with one another with two deflection axes, are located in the central area of the supports 5.1 and 5.2. The narrow deflecting rollers 4.1 through 4.4 are also mounted rotatably in the lateral supports 5.1 and 5.2. The louver 2, which forms an endless band, is guided around the deflecting rollers, and part of this endless band consists of a broad band 2.1 and the other part of two narrow bands 2.2 and 2.3, respectively, which pass over with their ends into the ends of the broad band. An opening is provided for the selector lever in the area of the broad band 2.1, and the two narrow bands 2.2 and 2.3 themselves form an opening through which a

selector lever can be passed.

The guiding of the band can be recognized especially clearly from Figure 2, which shows a side view of the slot cover. The band is guided such that the louver 2 surrounds the two broad deflecting rollers 3.1 and 3.2 on the end side and rolls on the gears 3.3 through 3.6 arranged on the broad deflecting rollers. The narrow deflecting rollers 4.1 through 4.4 are arranged outside the circumference of the band, and the small deflecting rollers 4.1 through 4.4 are pressed into the loop of the louver 2 and thus ensure a corresponding tension of the louver. On their edges, the deflecting rollers 4.1 through 4.4 have beads, which prevent the narrow bands 2.2 and 2.3 from breaking out. The division of the louver 2 in the area of the broad band 2.1 and in the area of the narrow bands 2.2 and 2.3 is designed such that the narrow deflecting rollers 4.1 through 4.4 come into contact only with the narrow bands 2.2 and 2.3 during a movement of the selector lever.

An additional guiding of the louver 2 is achieved by means of the lateral supports 5.1 and 5.2, which are curved on their top side and form a curvature, over which the louver 2 can slide. In addition, part of the central plate 5.3 is adapted to the curvature of the lateral supports 5.1 and 5.2, so that an improvement of the guiding of the louver is also achieved.

Figure 3 shows an oblique 3D bottom view of the slot cover according to the present invention, which once again illustrates the guiding of the louver and the function of the individual deflecting rollers.

The louver is very simple in terms of production technology in this preferred example, because, due to the entire design of the slot cover, it is possible to use a very thin and flexible endless rubber band, in which part of the rubber band is cut out on the inside, so that only the two narrow side bands 2.2 and 2.3 are left. In addition, the endless rubber band may be cut out of a long tube.

Figures 4 and 5 additionally show a longitudinal section and a front view of the slot cover according to the present invention with a cover plate 6, in which the shift and selection gates 7 for the selector lever are located.

If the slot cover according to the present invention is to be used for a shifting device with shift gates that have a lateral deflection, the opening for the selector lever in the louver 2 may be made in the area of the broad band 2.1 in the known manner such that either a sufficiently broad slot is inserted for the selector lever, or an additional,

transversely movable louver is integrated within the louver or is placed over the broad slot, so that complete coverage of the slot is always ensured.

Another possibility of covering the lateral mobility of the selector lever, in which case only a fitting hole is provided for the selector lever in the broad band, can be obtained by arranging the entire slot cover 1 laterally displaceably in relation to the cover plate 6, so that the entire slot cover 1 likewise moves to the side during a sideways movement of the selector lever.

Figures 6 and 7 show such a slot cover 1, which can be displaced as a whole in relation to the cover plate 6 by a sideways movement of the selector lever.

Figure 6 shows the slot cover 1 with a selector lever 8, which is passed through an opening 2.4 through the louver 2. A lateral position of the selector lever 8, by which the entire slot cover 1 including the support structure 5 is also displaced to the side, is indicated by broken line.

Figure 7 shows a bottom view of a cover plate 6, under which the slot cover 1 according to the present invention is arranged. The selector lever 8 - fixed in a sideways pivoted position - is indicated by broken line here as well, in which case the slot cover 1 has also been displaced in relation to the cover plate 6. The displaceability of the slot cover 1 in relation to the cover plate 6 may be achieved, e.g., by the support structure itself being fastened on the shifting device or on the slot cover with a bracket, which allows a lateral movement of the slot cover. It would be possible, e.g., to clip the slot cover with the axes of the broad deflecting rollers 3.1 and 3.2 in a clamp on the narrow sides, where the said clamps are substantially narrower in their broad extension than the length of the broad deflecting rollers, so that the entire slot cover 1 can be moved on it from right to left.

On the whole, it is consequently achieved with the slot cover according to the present invention of a shifting device of a motor vehicle transmission that reliable guiding of the louver is brought about and the louver is movable in the guide with low noise.

According to another aspect of the present invention, it is now also possible to make do without a second louver for covering the lateral mobility with a very simple design of the slot cover in shifting devices that are equipped with laterally movable selector levers, because the entire cover can now move laterally in itself.

09500822.072100

List of Reference Numbers:

	1	Slot cover
	2	Louver
	2.1	Broad band
5	2.2, 2.3	Narrow band
	2.4	Opening
	3.1, 3.2	Broad deflecting rollers
	3.3-3.6	Gear
	4.1-4.4	Narrow deflecting rollers
10	5	Support structure
	5.1, 5.2	Lateral support
	5.3	Central plate
	5.4	Opening in the central plate
	6	Cover plate
	7	Shift gate
	8	Selector lever

Slot Cover of a Shifting Device

Patent Claims:

1. Slot cover of a shifting device of a motor vehicle transmission with a selector lever and a kinematics for transmitting the selection movements to the automatic transmission, with a movable louver, which covers at least one movement gate (shift gate, selection gate), and with a guide for the louver, wherein the louver has at least one opening for the passage of the selector lever,
characterized in that the said louver (2) is an endless band, which forms a closed loop.
2. Slot cover in accordance with claim 1,
characterized in that the guide of the louver has at least one said deflecting element (3.1, 3.2, 4.1-4.4, 5.1, 5.2, 5.3).
3. Slot cover in accordance with one of the above claims,
characterized in that at least one said deflecting element (5.1, 5.2, 5.3) has a curved deflecting surface.
4. Slot cover in accordance with one of the above claims,
characterized in that at least one said deflecting element (3.1, 3.2, 4.1-4.4) is a deflecting axis or deflecting shaft.
5. Slot cover in accordance with claim 4,
characterized in that the deflecting axis or deflecting shaft, of which there is at least one, is designed as a said continuous rotating deflecting roller (3.1, 3.2), which has said gears (3.3-3.6) at its edge.
6. Slot cover in accordance with one of the above claims 4 or 5,
characterized in that at least one deflecting axis or deflecting shaft comprises two said coaxially

mounted deflecting rollers (4.1, 4.2 and 4.3, 4.4), which are separated from one another and have elevated edge beads.

7. Slot cover in accordance with one of the above claims 2-6,
characterized in that at least one of the said deflecting elements (3.1, 3.2) and preferably two deflecting elements is/are arranged within the said louver loop (2).
8. Slot cover in accordance with one of the above claims 2-7,
characterized in that at least one of the said deflecting elements (4.1-4.4) and preferably two deflecting elements is/are arranged outside the louver loop.
9. Slot cover in accordance with one of the above claims 2-7,
characterized in that at least one said deflecting element (3.1, 3.2, 4.1-4.4, 5.1, 5.2, 5.3) is mounted elastically.
10. Slot cover in accordance with one of the above claims,
characterized in that the said louver (2) is designed as an elastic louver at least over part of its length, at least in the circumferential direction.
11. Slot cover in accordance with one of the above claims,
characterized in that the louver has a multipart design.
12. Slot cover in accordance with one of the above claims,
characterized in that slide rails, which are preferably arranged laterally and which are engaged by the louver, are provided for guiding the said louver (2).
13. Slot cover in accordance with one of the above claims,
characterized in that the louver has two openings, through which the selector lever passes.
14. Slot cover in accordance with one of the above claims,
characterized in that a said cover plate (6) with at least one said shift gate (7) is additionally provided

for the selector lever.

15. Slot cover in accordance with one of the above claims,
characterized in that signal transmitters, whose signals are detected by signal receivers arranged at spaced locations from them, are arranged on the deflecting elements for detecting the shift positions of the selector lever.

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16. Slot cover in accordance with claim 15,
characterized in that the shift positions are detected by means of Hall sensors and permanent magnets associated with them, wherein a pair of measured values is correspondingly assigned to each shift position.

17. Slot cover in accordance with one of the above claims or the preamble of claim 1,
characterized in that the said louver (2) including its said guide (3.1-5) is designed as a louver that can be displaced in relation to the cover plate at right angles to the direction of movement of the louver.

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Figure 1
through
Figure 7

Slot Cover of a Shifting Device

Abstract:

The present invention pertains to a slot cover of a shifting device of a motor vehicle transmission with a selector lever and a kinematics for transmitting the selection movements to the automatic transmission, with a movable louver, which covers at least one movement gate (shift gate, selection gate) and with a guide for the louver, wherein the louver has at least one opening for the passage of the selector lever.

The present invention is characterized in that the louver (2) is an endless band, which forms a closed loop.

Figure 4

Figure 4

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Fig. 1

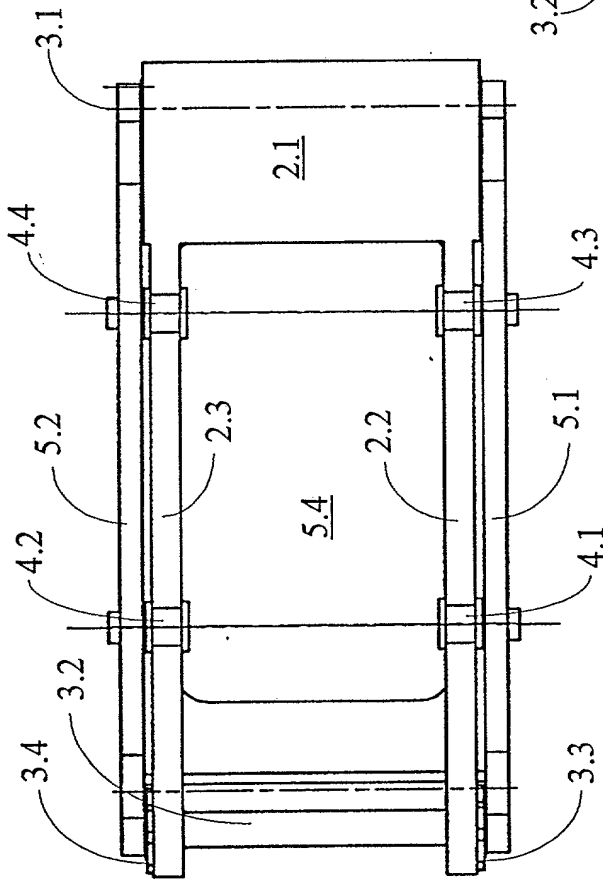


Fig. 3

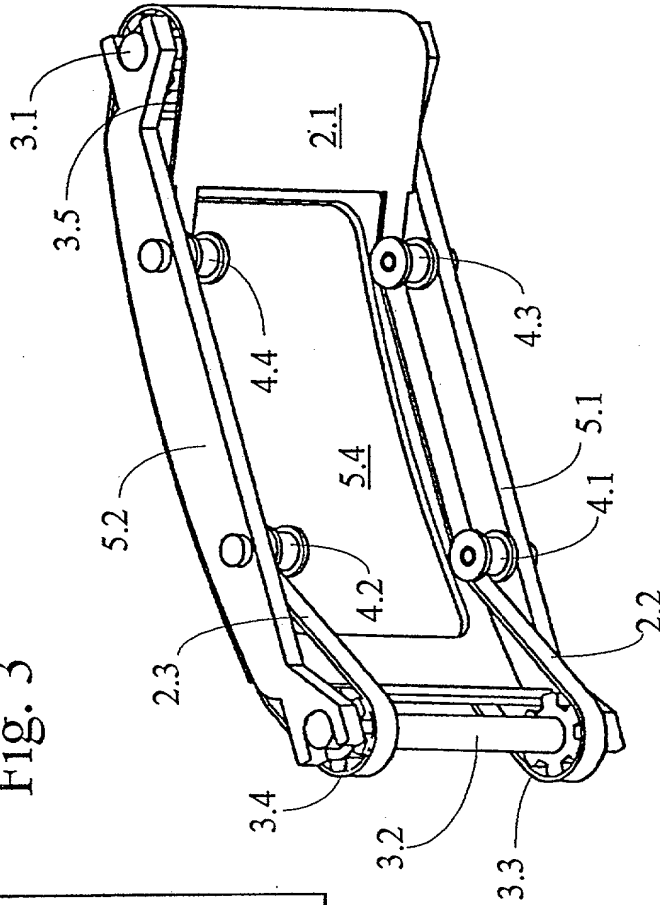


Fig. 2

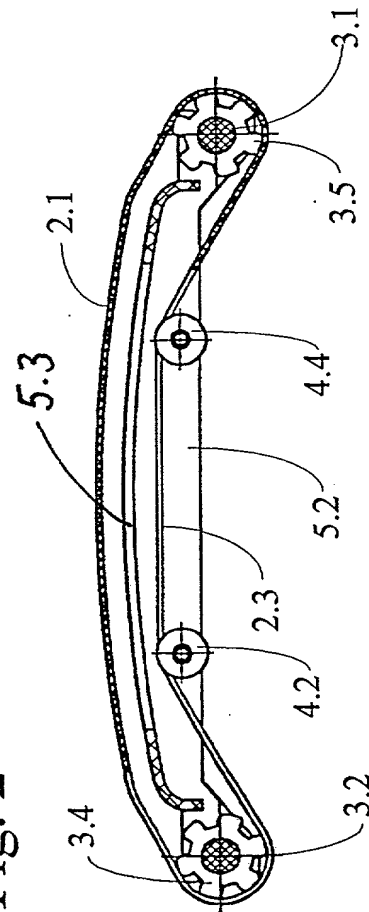


Fig. 5

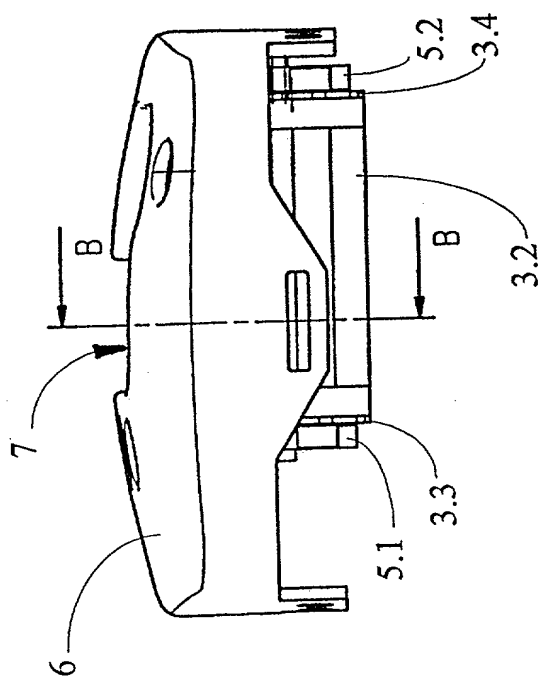


Fig. 4

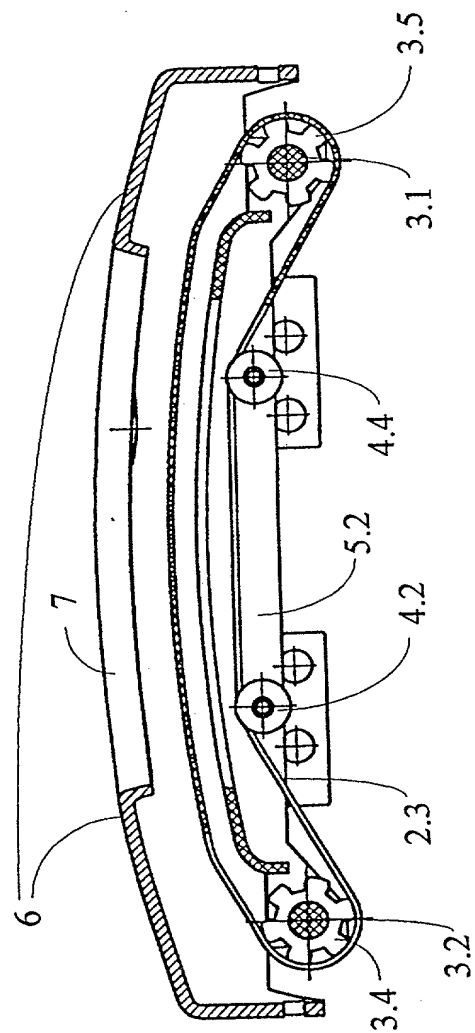


Fig. 7

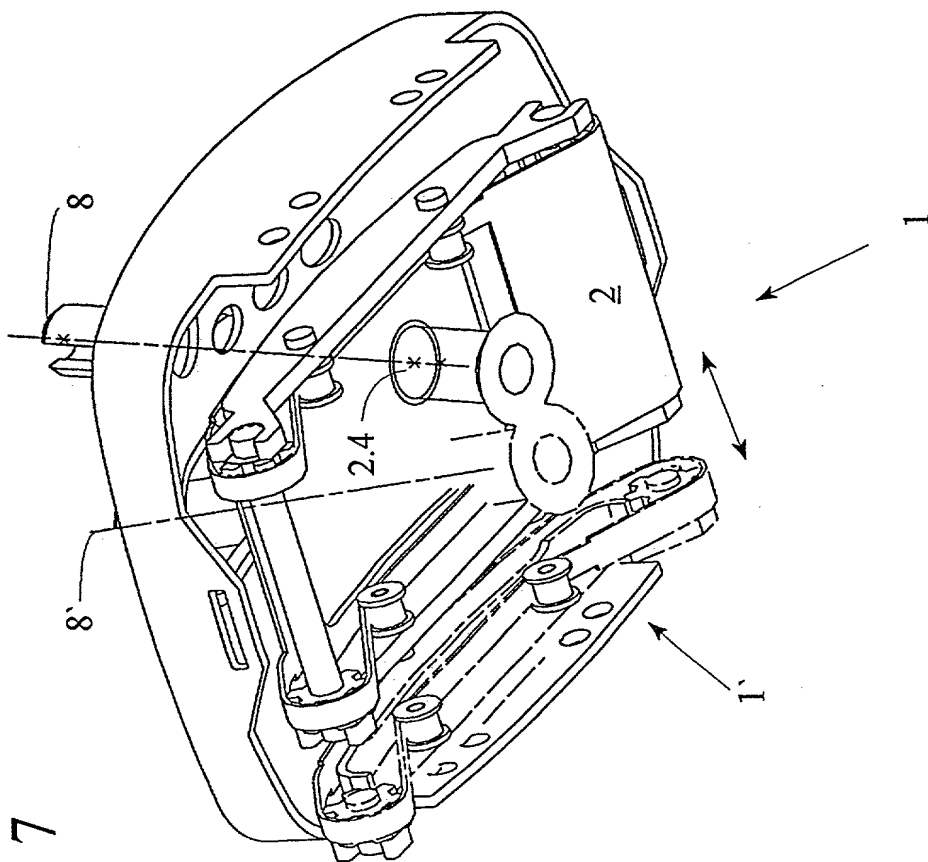
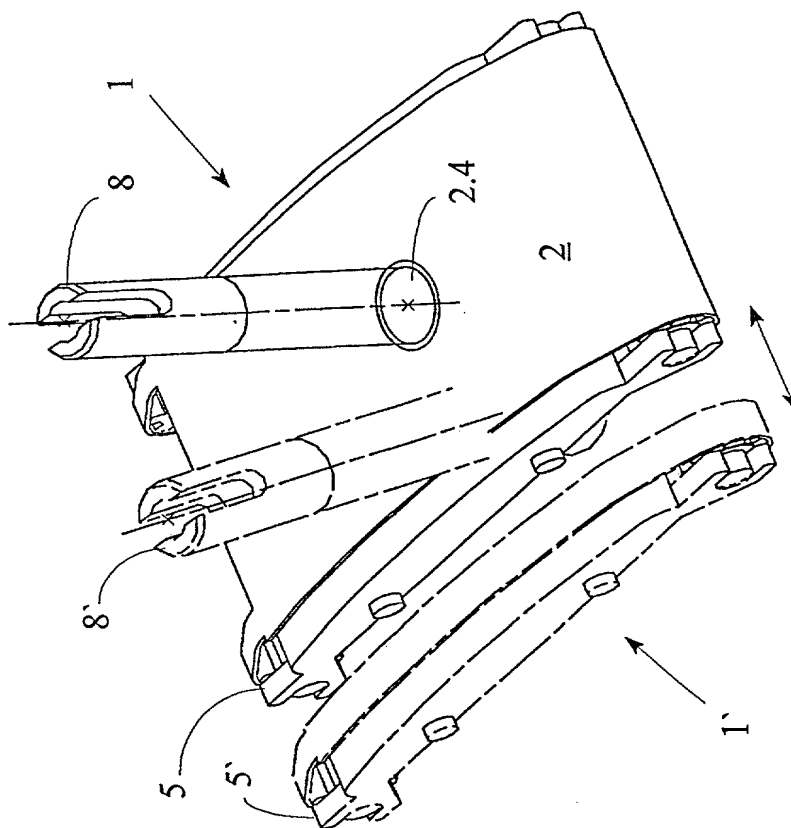


Fig. 6



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DECLARATION FOR PATENT APPLICATION

Docket No.67526

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: SLOT COVER OF A SHIFTING DEVICE

the specification of which

(Check one) ☐ is attached hereto.

☒ was filed as PCT international application

Number PCT/DE99/03704

on November 22, 1999

and was amended under PCT Article 19

on _____

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal Regulations, 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, 119 (a)-(d) or 365 (b) of any foreign application(s) for patent or inventor's certificate or 365 (a) of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate having a filing date or any PCT international application(s) designating at least one country other than the United States of America by me on the same subject matter having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

DE 198 53 932.0

(Number)

GERMANY

(Country)

23/Nov/1998

(Day/Month/Year filed)

Priority Claimed

YES

(Number)

(Country)

(Day/Month/Year filed)

(Number)

(Country)

(Day/Month/Year filed)

I hereby claim the benefit under Title 35, United States Code, 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code 112. I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, 1.56 which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No)

(Filing Date)

(Patented, Pending, Abandoned)

(Application Serial No)

(Filing Date)

(Patented, Pending, Abandoned)

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: John J. McGlew, Reg. 17,722; and/or John James McGlew, Reg. 31,903; and/or Hilda S. McGlew Reg. 30,295; and/or Theobald Dengler, Reg. 34,575; and/or Clario Ceccon, Reg. 19,268; and/or Kristina M. Grasso Reg. 39,205.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

1-00
Full name of sole or first inventor Andreas GIEFER

→Inventor's signature Andreas Giefer

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17.02.00

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